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Agriculture Development Branch
Editor—Albert Tenuta– Field Crop Pathologist
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Comments, suggestions or articles are welcome. To be added to the distribution list please contact:

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2012 Grain Corn Ear Mould and Vomitoxin Survey

Greg Stewart, OMAFRA Corn Specialist, Guelph
Albert Tenuta, OMAFRA Field Crop Pathologist, Ridgetown

Survey

As in previous years, the OMAFRA Field Crops team has recently completed a survey of the 2012 Ontario corn crop to determine ear mould incidence as well as the occurrence of mycotoxins in the grain. These mycotoxins, particularly vomitoxin (DON) produced primarily by Gibberella/Fusarium ear moulds can be disruptive when fed to livestock, especially hogs.

A total of 171 samples were collected from September 18 to 25, 2012 from corn fields across the province. In each field, 2 random areas were selected and in each area 10 consecutive ears were hand harvested and bagged. In fields with several hybrids, representative samples were taken again from two areas for each hybrid (maximum of 4 hybrids per field). The 20 ear samples were then immediately dried and shelled. The resultant sample was thoroughly mixed and a sub-sample was provided to A& L Canada Laboratories in London for vomitoxin (DON) and aflatoxin analysis.

PIONEER. A DuPont Company
Hyland Seeds BUILDING
NK syngenta
Bayer CropScience
FS
MONSANTO imagine
BASF The Chemical Company

2012 Grain Corn Ear Mould and Vomitoxin Survey

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Of the 171 samples collected, **85 %** (146) had a DON level of less than 0.5 PPM; **11 %** (19) had DON concentrations of 0.6 to1.9 PPM; and only **4 %** (6) were found to have DON levels of 2.0 PPM or greater; with no sample being above 3.0 PPM DON. In comparison, the 2011 OMAFRA survey showed 23 % of samples had DON levels of 2.0 PPM or greater. Clearly the incidence of Gibberella and Fusarium ear moulds and DON is minimal this year; perhaps the lowest levels that we have encountered in the past decade. Samples that had slightly elevated DON levels were generally in the southwest part of the province but no specific area could be identified as having a concern for elevated DON.

What about Aflatoxins?

The concern in the US surrounding another mycotoxin "aflatoxin" has not gone unnoticed in Ontario. In corn, aflatoxin is produced by the fungal pathogen *Aspergillus flavus* which causes Aspergillus ear rot. The hot dry conditions across much of the corn growing area of North America have been favourable for Aspergillus ear rot and unfortunately aflatoxin production as well. In Ontario, environmental conditions are often more favourable for Gibberella, Fusarium, Diplodia and other ear rots rather then Aspergillus. Although Aspergillus ear rot and aflatoxin production is rare in Ontario corn, OMAFRA determined due to the concern and environmental conditions this year to test for aflatoxin as well. A subset of 26 samples from the total 171 collected was tested for aflatoxin. All 26 samples (100%) were found to have no detectable aflatoxin.

Moving Forward

Although the survey indicates that the 2012 Ontario corn crop is distinctly low in ear moulds and vomitoxin stakeholders are reminded that individual field conditions (environment, hybrid, tillage, rotation, etc.) are important in ear mould and mycotoxin development. Growers should scout for visual moulds and test for vomitoxin as warranted.

Acknowledgement

Appreciation is extended to the Grain Farmers of Ontario and A&L Canada Laboratories for their support of this survey and analysis.

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SOUTHWEST AGRICULTURAL CONFERENCE

Mark your Calendars for the Southwest Agricultural Conference—2013!
Thursday, January 3 and Friday, January 4, 2013

www.southwestagconference.ca

2012 Grain Corn Ear Mould and Vomitoxin Survey

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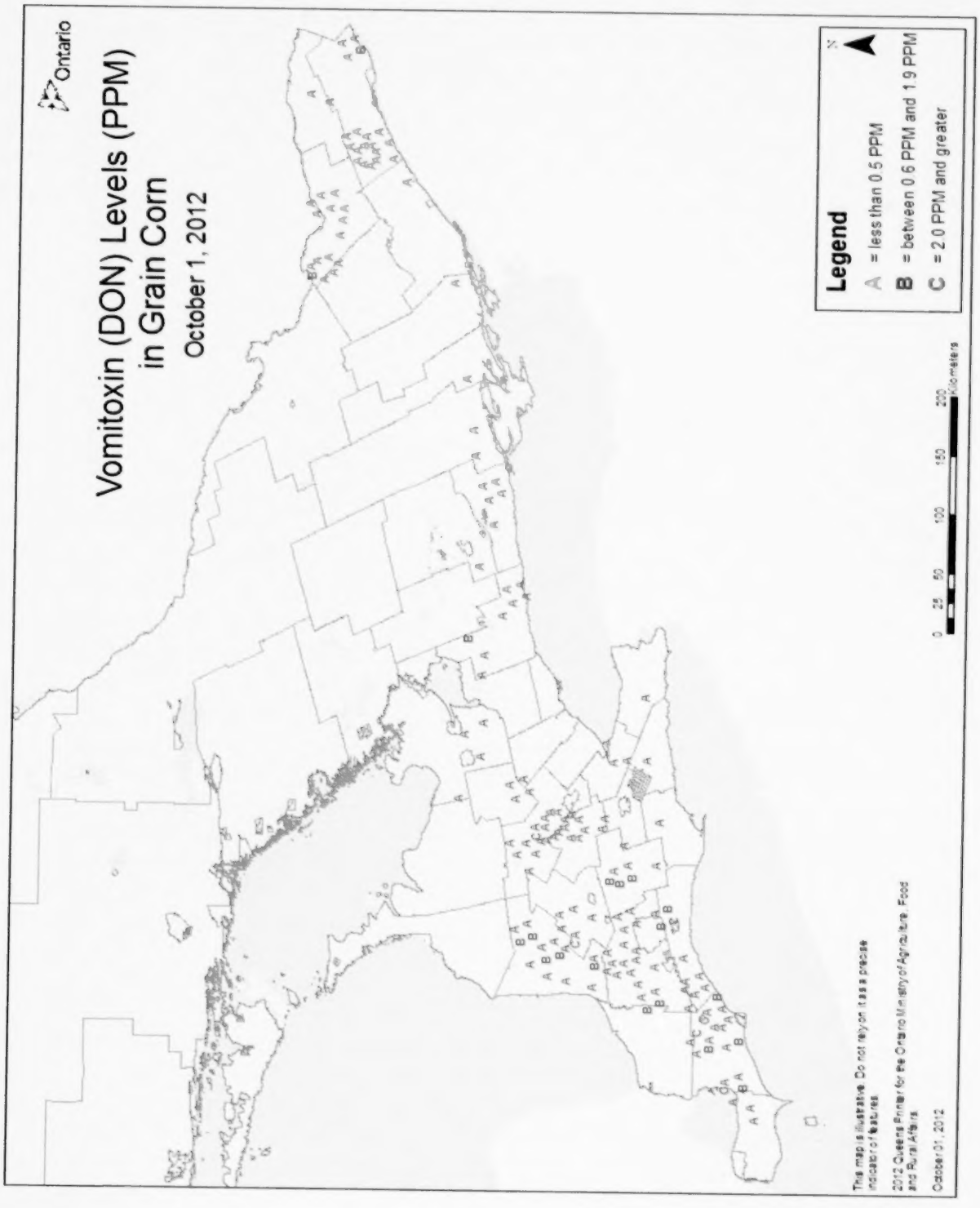
Ontario
Vomitoxin (DON) Levels (PPM) in Grain Corn
October 1, 2012
Legend
A = less than 0.5 PPM
B = between 0.6 PPM and 1.9 PPM
C = 2.0 PPM and greater
N
0 25 50 100 150 200
Kilometers
This map is illustrative. Do not rely on it as a precise indicator of features
2012 Queens Printer for the Ontario Ministry of Agriculture, Food and Rural Affairs
October 01, 2012

Brown Marmorated Stink Bug Monitoring Project Date (2012)

Tom Cowan, Entomologist, OMAFRA, Ridgetown

Background:

The brown marmorated stink bug (BMSB) is an invasive alien species native to China, South Korea, Taiwan and Japan. It was introduced to North America in the mid 1990s, and was first detected in Allentown, Pennsylvania in 2001. While BMSB is capable of natural spread, the pest is also an excellent hitchhiker and can be moved over large distances in cargo and vehicles. At present it has been found in at least 35 states, though many of these are simply detections rather than confirmed as established in the field.

This pest has a very broad host range including tree fruit, berries, grapes, vegetables, agronomic crops, ornamental trees and ornamental shrubs. In field crops, corn and soybeans are its preferred hosts. BMSB over winter in sheltered areas including homes and other buildings and unlike other stink bugs, tend to form aggregations in these areas during the winter. Populations of BMSB tend to become established in urban areas first then spread out to cause damage to agricultural crops. Because this pest has the potential to cause serious issues for growers, a monitoring program to track this pest in corn and soybeans was undertaken in 2011 and 2012.

Scouting Program 2012

The 2012 BMSB Monitoring Program in corn and soybean fields was very successful this year. A total of 133 fields were scouted in two scouting periods in July and August. These fields included 75 corn fields and 40 soybean fields. A few wheat fields were also included in the spring to see if BMSB might be present in early growing wheat. In addition to the field crop locations, 8 urban scouting locations were added and included locations near boarder crossings in Windsor and Sarnia and host trees in 2 recreational camping sites in London ON. Some rest stops along the 401 in south western and eastern Ontario were also included. Field selection for scouting was based on proximity to horticultural crops, tourist locations and areas where specimens have been found. The majority of fields scouting for BMSB this summer were in south western and central Ontario (Figure 1).

No BMSB were found in corn, soybean, wheat or the urban locations scouted in 2012

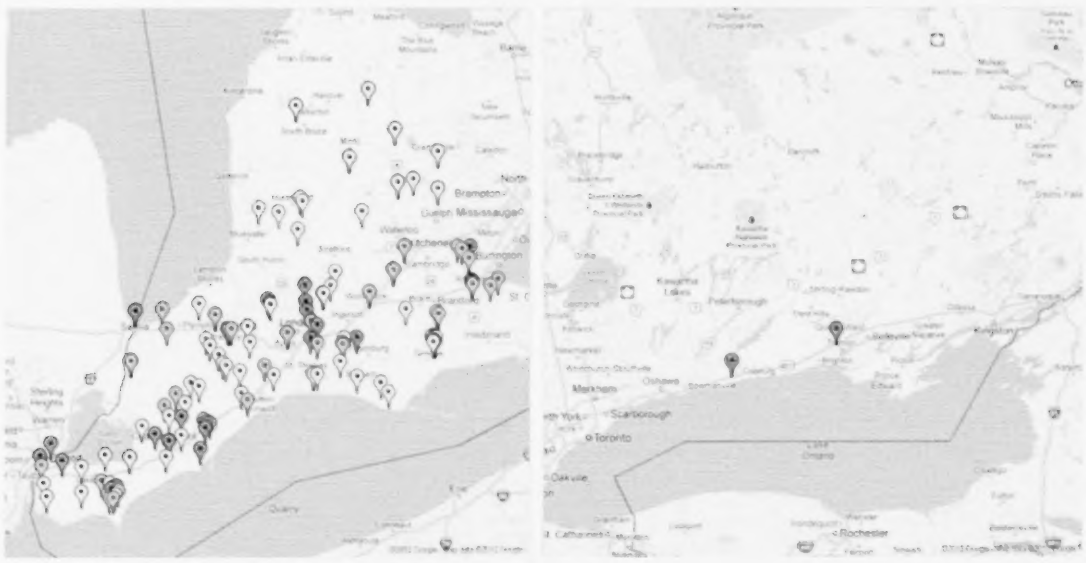

Figure 1: BMSB scouting locations 2012 for SW (left) and E (right) Ontario. Blue markers = wheat fields, green markers = soybean fields, yellow markers = corn fields and purple markers = urban/recreational locations.

Brown Marmorated Stink Bug Monitoring Project Date (2012)

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Confirmed detections of BMSB have been found in Hamilton ON but so far our monitoring program has not detected any BMSB moving into corn or soybean crops. This may change as populations of the stink bug build and begin to move into agricultural areas. Growers should be on the look out for this pest in their fields since early detection can help with management decisions. For more information on BMSB including how to identify this pest, please see the following Link:
http://www.omafra.gov.on.ca/english/crops/insects/bmsb-resources.html

If you think you have found a BMSB please contact OMAFRA's Agricultural Information Centre at 1-877-424-1300 orag.info.omafra@ontario.ca

Acknowledgements

The success of the monitoring project this year would not have been possible without support from the Grain Farmers of Ontario, Cara McCreary (University of Guelph) and our excellent filed crew: Jen Bruggeman (research technician) and summer students Brianna Vyn and Jake Szczechura.

UNIVERSITY of GUELPH
RIDGETOWN CAMPUS

OSCIA

Ontario

Cover Crop Tour and Open House
Thursday, 18th October 2012

For commercial growers and agribusinesses

9:30 a.m.—starts at 11234 Cedar Hedge Line, just south of Dresden

Lunch at noon—University of Guelph Ridgetown Campus, Willson Hall

-No cost. No pre-registration required. CCA credits have been applied for

-Worth the extra cost? – Compare oilseed radish common vs. named varieties

-Cover crops planted after wheat, and into corn and seed corn,

-Many different cover crops – single and in mixtures (alfalfa, red clover, vetch, crimson clover, forage pea, oilseed radish, mustard, ryegrass)

-Funding provided by Seed Corn Growers of Ontario, OSCIA Regional Project Grant, and OMAFRA.

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Fall Control of a Red Clover Cover Crop

Mike Cowbrough, Weed Management Field Crops, Guelph

A beautiful stand of red clover can provide as much as 75 kg of nitrogen per hectare (when at 40 cm tall) for next years corn crop. However, if the clover crop is not "killed off" in the fall, then preparing a suitable seedbed to plant next years crop in is often significantly delayed resulting in reduced yields. A review of different strategies to control red clover in the fall are presented below.

Figure 1. Control of red clover in the spring following fall tillage with a moldboard plow.

Figure 2. Control of red clover in the spring following fall tillage with a chisel plow.

Figure 3. Control of red clover in the spring following a fall application of dicamba. Note that glyphosate will have to be tank-mixed with diamba to remove volunteer cereals

When is the best time to retire the red clover stand?

A research project conducted by Dr. Steve Bowley (University of Guelph) demonstrated that red clover gains significant root biomass during the month of October. Therefore killing off the stand in September could be shorty changing your nitrogen credit for next spring. Results of Dr. Bowley's study is nicely summarized in this short 10 min presentation.

Managing options for red clover

Fall plowing is the only effective tillage operation for managing red clover (Figure 1). If your preference is to use less aggressive tillage (e.g. chisel plow – Figure 2) or no-till, then a herbicide burndown is needed. Research conducted by the University of Guelph has consistently shown that the best and most cost effective herbicide for controlling red clover is dicamba (e.g. Banvel II, Oracle, Hawkeye) applied at 600 mL/ha (or 250 mL/ac – refer to Figure 3). The application timing of dicamba in many of these trials has gone into to mid- to late-October. This is also an opportune time to manage perennial weeds (using a glyphosate + dicamba tank-mix). The key is to ensure that the air temperature at application is greater than 10 ºC, and that the nighttime temperature after application stays ideally at 5 ºC or greater.

Can I Reduce the Rate of Dicamba or Use 2,4-D Instead?

When dicamba rates were reduced to 300 mL/ha (125 mL/ac), red clover control was unacceptable (refer to Figure 4). 2,4-D (660 g/L) has been inconsistent in recent public trials when applied alone at 1.25 L/ha (500 mL/ac – Figure 5). The addition of 2,4-D to glyphosate (Figure 6) has not significant improved control of red clover when compared to glyphosate alone (Figure 7). However, over a decade ago, Dr. Clarence Swanton (University of Guelph) observed effective control of red clover with fall applications of glyphosate + 2,4-D.

Figure 4. Control of red clover in the spring following a fall application of dicamba at a reduced rate (125 ml/ac).

Figure 5. Control of red clover in the spring following a fall application of 2,4-D.

Figure 6. Control of red clover in the spring following a fall application of glyphosate + 2,4-D.

Figure 7. Control of red clover in the spring following a fall application of glyphosate alone.

Table 1. Red Clover Control and relative cost of various fall management strategies.

Treatment	Rate/ac	Control*
dicamba	250 mL	99%
glyphosate (540 g/L) + dicamba	500 mL + 250 mL	99%
fall plough		95%
Amitrol	1670 mL	90%
glyphosate (540 g/L) + amitrol	500 mL + 1000 mL	90%
glyphosate (540 g/L)	1.34 L	85%
2,4-D Ester (700 g/L)	500 mL	65%

Source: Dr. Peter Sikkema, Dr. Clarence Swanton and Dr. François Tardif
*** Control evaluated in April following the fall applications**

What About Volunteer Wheat?

Since dicamba won't control any volunteer wheat (Figure 3), glyphosate will need to be tank-mixed (Figure 8). The lowest labeled rate of a glyphosate 540 g/L concentration (i.e. Roundup Weathermax) that can be tank-mixed with dicamba for the control of volunteer cereals is 0.5 L/ac.

Figure 8. Control of red clover in the spring following a fall application of glyphosate + dicamba.